ABSTRACT

Although normal microphones are very cheap, their range is usually limited up to around 10KHz and is typically not free from various distortions. Other microphones that can reach 20KHz or close to it typically cost tens or hundreds of dollars and still have various limitations, and higher-end microphones, for example of the types needed for Live Music performance or for the Mass media broadcasting, such as for example Radio or TV, are typically much more expensive and can cost even thousands of dollars. The main reason for these limitations is the fact that normal Microphones use a membrane, which is a mechanical element, and therefore they are limited by the mechanical qualities of the membrane. The present invention solves this problem by using a high quality Membrane-less Microphone capable of functioning in a very wide range of frequencies without distortions, which can be at the same time very compact and much cheaper than the state-of-the-art high-end microphones. This is preferably based on detecting the distortions that the detected sound waves create on preferably high frequency ultrasound waves. In some of the embodiments this microphone can also be easily made directional or even very directional, and also its directionality can preferably be easily changed dynamically, and it can be much less affected by electromagnetic interference. Similar or other principles are described also for reproducing sounds in a speaker without the physical limitations of a normal membrane.